

## CLAIMS

What is claimed is:

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1. An adenovirus vector comprising an adenovirus gene under transcriptional control of a carcinoembryonic antigen transcriptional regulatory element (CEA-TRE).

2. The adenovirus vector of claim 1, wherein the adenovirus gene is essential for viral replication.

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3. The adenovirus vector of claim 2, wherein the adenovirus gene is an early gene.

4. The adenovirus of claim 2, wherein the adenovirus gene is a late gene.

5. The adenovirus vector of claim 3, wherein the adenovirus early gene is E1A.

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6. The adenovirus vector of claim 3, wherein the adenovirus early gene is E1B.

7. The adenovirus vector of claim 1, wherein the adenovirus gene is the adenovirus death protein gene (ADP).

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8. The adenovirus vector of claim 1, wherein the CEA-TRE comprises an enhancer from a carcinoembryonic antigen gene.

9. The adenovirus vector of claim 1, wherein the CEA-TRE comprises a promoter from a carcinoembryonic antigen gene.

10. The adenovirus vector of claim 1, wherein the CEA-TRE comprises a promoter from a carcinoembryonic antigen gene and an enhancer from a carcinoembryonic antigen gene.

11. The adenovirus vector of claim 1, wherein the CEA-TRE comprises the nucleotides about 313 to about 472 of SEQ ID NO:1

12. The adenovirus vector of claim 1, wherein the CEA-TRE comprises the nucleotides about 104 to about 472 of SEQ ID NO:1

13. The adenovirus vector of claim 1, wherein the CEA-TRE comprises the sequence of SEQ ID NO:1.

14. A composition comprising an adenovirus of claim 1.

15. A composition of claim 14, further comprising a pharmaceutically acceptable excipient.

16. The adenovirus vector of claim 1, further comprising at least one additional adenovirus gene under transcriptional control of at least one additional CEA-TRE.

17. A composition comprising an adenovirus of claim 16.

18. The composition of claim 17, further comprising a pharmaceutically acceptable excipient.

19. An adenovirus vector of claim 1, further comprising a heterologous gene under transcriptional control of a carcinoembryonic antigen transcriptional regulatory element (CEA-TRE).

20. The vector of claim 19, wherein the heterologous gene is a reporter gene.

21. The vector of claim 19, wherein the heterologous gene is conditionally required for cell survival.

22. A host cell transformed with an adenovirus vector of claim 1.

23. A host cell transformed with an adenovirus vector of claim 16.

5           24. A method of detecting cells that allow a CEA-TRE to function in a biological sample comprising the steps of:

          contacting a biological sample with an adenovirus vector of claim 1, under conditions suitable for CEA-TRE-mediated gene expression in cells that allow a CEA-TRE to function; and

10           determining if CEA-TRE mediates gene expression in the biological sample,

          wherein CEA-TRE-mediated gene expression is indicative of the presence of cells that allow a CEA-TRE to function.

          25. A method of propagating adenovirus specific for cells that allow a CEA-TRE to function, said method comprising:

15           combining an adenovirus according to claim 1 with cells that allow a CEA-TRE to function,

          whereby said adenovirus is propagated.

          26. A method of propagating an adenovirus specific for cells that allow a CEA-TRE to function, said method comprising:

20           combining an adenovirus according to claim 16 with cells that allow a CEA-TRE to function,

whereby said adenovirus is propagated.

27. A method for modifying the genotype of a target cell, said method comprising contacting a cell that allow a CEA-TRE to function with an adenovirus vector of claim 1, wherein the vector enters the cell.

5 28. A method for modifying the genotype of a target cell, said method comprising contacting a cell that allow a CEA-TRE to function with an adenovirus vector of claim 16, wherein the vector enters the cell.

10 29. A method for conferring selective cytotoxicity on a target cell, said method comprising contacting a cell that allow a CEA-TRE to function with an adenovirus vector of claim 1, wherein the vector enters the cell.

30. A method for conferring selective toxicity on a target cell, said method comprising contacting a cell that allows a CEA-TRE to function with an adenovirus vector of claim 16, wherein the vector enters the cell.

15 31. A method of treating a CEA-associated tumor in an individual, comprising the step of administering to the individual an effective amount of an adenovirus vector of claim 2.

32. The method of claim 31, wherein the adenovirus gene is an early gene.

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